Appendix to Amendment A

With Replacement Paragraphs Marked-Up to Indicate Changes

Mailed: October 13, 2005

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Sir:

Pursuant to Rule 121, the following is a copy of all of the paragraphs amended by the attached Amendment A, with all changes indicated by bracketing for five character or fewer deletions, by strikethrough for deletion matter, and by underlining for added matter:

Page 1 – Page 7, in Background Section, replace with the following new Background Section:

--- This invention is generally relative to ~~short-range wireless~~ a dual-mode ~~transceiver of~~ ultra wideband ~~communications~~ (UWB) and wireless local area network (WLAN) communications.

--- On April 22, 2002, U.S. Federal Communications Commission (FCC) released the revision of Part 15 of the Commission's rules regarding UWB transmission systems to permit the marketing and operation of certain types of new products incorporating UWB technology. With appropriate technology, UWB ~~device~~ devices can operate using spectrum occupied by existing radio service without causing interference, thereby permitting scare spectrum resources to be used more efficiently. The UWB technology offers significant benefits for Government, public safety, businesses and consumers under an unlicensed basis of operation spectrum.

--- The UWB ~~device~~ devices can be classified [[in]] into three types based on the operating restrictions: (1) imaging ~~system~~ systems including ground penetrating radars and wall, through-wall, surveillance, and medical imaging device, (2) vehicular radar systems, and (3) communications and measurement systems. In general, FCC is adapting unwanted emission limits for the UWB devices that are significantly more stringent than those imposed on other Part 15 devices. In other words, FCC limits outdoor use of the UWB ~~device~~ devices to imaging systems, vehicular radar systems and handheld devices. Limiting the frequency bands, which is based on the –10 dB bandwidth of the UWB emission[[,]] within certain UWB ~~product~~ products, will be permitted to operate. For the communications and measurement systems, FCC provides a wide variety of the UWB devices, such as high-speed home and business networking devices as well as storage tank measurement devices under the Part 15 of the Commission's rules subject to certain frequency and power limitations. The UWB ~~device~~ devices must operate in the frequency band from 3.1 GHz to 10.6 GHz. The UWB ~~communication~~ devices should also satisfy ~~by~~ the Part 15.209 limit, which sets emission limits for indoor and outdoor UWB ~~system~~ systems, for the frequency band below 960 MHz, and the FCC's emission masks for the frequency band above 960 MHz.

--- For the indoor UWB communication operation, Table 1 lists the FCC indoor restrictions of the emission masks (dBm) along with the frequencies (GHz).

Table 1

Frequency (MHz)	EIRP (dBm)
0-960	-41.3
960-1610	-75.3
1610-1990	-53.3
1990-3100	-51.3
3100-10600	-41.3

Above 10600	-51.3

--- The outdoor handheld UWB communication ~~systems~~ devices are intended to operate in a peer-to-peer mode without restriction on location. However, the outdoor handheld UWB communication ~~device~~ devices must operate in the frequency band from 3.1 GHz to 10.6 GHz as well, with an extremely conservative out of band emission masks to address interference with other communication devices. The outdoor handheld UWB communication devices are permitted to emit at or below the Part 15.209 limit in the frequency band below 960 MHz. The emissions above 960 MHz for the outdoor handheld UWB communication devices must conform to the following emission masks as shown in Table 2:

Table 2

Frequency (MHz)	EIRP (dBm)
0-960	-41.3
960-1610	-75.3
1610-1900	-63.3
1900-3100	-61.3
3100-10600	-41.3
Above 10600	-61.3

--- FCC proposed to define a UWB device as any device where the fractional bandwidth is greater than 0.25 based on the formula as follows:

$$FB = 2\left(\frac{f_H - f_L}{f_H + f_L}\right), \qquad (1)$$

where f_H ~~is~~ and f_L are the upper and lower ~~frequency~~ frequencies of the –10 dB emission points, respectively. ~~and f_L is the lower frequency of the –10 dB emission point.~~ The center frequency of the UWB

transmission is defined as the average of the upper and lower –10 dB points. That is

$$F_C = \frac{f_H - f_L}{2}. \qquad (2)$$

In addition, a minimum bandwidth of 500 MHz must be used for indoor and outdoor UWB devices regardless of center frequency.

--- The indoor UWB communication devices must be designed to ensure that operation can only occur indoor according to the indoor emission masks in Table 1. ~~or it must consist of~~ The outdoor ~~hand-held~~ handheld UWB communication devices that may be employed for such activities as peer-to-peer operation must be designed according to the outdoor emission masks in Table 2. Both of the indoor and outdoor ~~Such~~ UWB communication devices can be used for wireless communications, particularly for short-range high-speed data transmissions suitable for broadband access to networks.

--- ~~The~~ UWB communication transceiver for the indoor and outdoor operation can transmit and receive ~~the~~ UWB signals by using one channel and/or up to 11 channels in parallel according to some embodiments of the present invention. Each channel of the UWB communication transceiver has a frequency bandwidth of 650 MHz that can transmit 40.625 ~~Msps~~ Mega bits per second (Mbps). That is, a total of 11 channels are able to transmit 446.875 ~~Msps~~ Mbps. The UWB communication transceiver also employs the orthogonal spread codes for all the channels. With 16 [[PN]] pseudorandom noise (PN) spread sequence codes for each bit, each channel achieves 650 ~~Mcps~~ Mega chips per second (Mcps). The UWB communication transceiver for the indoor and outdoor operation can transmit and receive the chip data rate up to 7.150 ~~Gcps~~ Giga chips per second (Gcps).

--- WLAN 802.11a is an IEEE standard for wireless LAN medium access control (MAC) and physical layer (PHY) specification and is also referred to as the high-speed physical layer in the 5 GHz band. The WLAN 802.11a standard specifies a PHY entity for an orthogonal frequency division multiplexing (OFDM) system. The radio frequency LAN communication system is initially aimed for the lower band of the 5.15 – 5.35 GHz and the upper band of the 5.725 – 5.825 GHz unlicensed national information structure (U-NII) bands, as regulated in the United States by the code of Federal Regulations under Title 47 and Section 15.407. The WLAN 802.11a communication system provides the data payload rate of 6, 9, 12, 18, 24, 36, 48 and 54 ~~Mbit/s~~ Mbps. Also, the WLAN 802.11a communication system supports the transmitting and receiving at data rate of 6, 12, and 24 ~~Mbit/s~~ Mbps with mandatory. The WLAN 802.11a communication system uses 52 subcarriers with modulation of using binary or quadrature phase shift keying (BPSK/QPSK), 16-quadrature amplitude modulation (QAM), or 64-QAM. The forward error correction coding (FEC) of convolutional encoding is used with a coding rate of 1/2, 2/3, or 3/4.

--- The UWB communication transceiver can achieve the transmission distance in a range of 3 meters to 10 meters since the UWB communication transceiver has to transmit the data with very-low power due to the restriction of FCC emission limitation for the indoor and outdoor operation. The UWB communication transceiver can transmit and receive a very-high data rate in the range from 40.625 to 446.875 [[Msps]] Mbps according to some embodiments of the present invention. On the other hand, the WLAN 802.11a communication system can only transmit and receive the data rate in a range from 6 to 54 Mbps, but with a longer transmission distance up to 100 meters.

--- Since the UWB communication transceiver for the indoor and outdoor operation can transmit and receive the very-high data rate with the short-distance while the WLAN 802.11a communication system can transmit and receive the data up to a much longer distance than the UWB device, but has a lower transmission data rate for the device. Therefore, developing a ~~dual-dome~~ dual-mode transceiver of the UWB communication system for the indoor and outdoor operation and the WLAN 802.11a communication system is very important since [[the]] trade-offs of the transmission distance and data rate between the UWB and the WLAN 802.11a ~~transmission distance and data rate~~ transceiver can be mutually utilized ~~each other~~ for benefits. ~~thereby having a~~ This allows the UWB and WLAN 802.11a transceiver with co-existence in an environment.

--- Thus, there is a continuing need for a dual-mode UWB and WLAN communication system that operates using more than one standard and enables a user to use the same communication device in areas in which operate under different standards for the short-range wireless broadband communications.

Page 7, in Summary Section, replace with the following new Summary Section:

--- In accordance with one aspect, the dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver includes a digital lowpass-shaping filter system coupled to a [[UWB]] ultra wideband multichannel [[PN]] pseudorandom noise sequence mapping or coupled to a ~~WLAN IFFT~~ wireless local area network inverse fast Fourier transform and [[I/Q]] image/quadrature modulation, a dual-mode sampling frequency rate coupled to a digital-to-analog converter, and a switch to connect from the [[UWB]] ultra wideband multichannel [[PN]] pseudorandom noise sequence mapping or the ~~WLAN IFFT~~ wireless local

area network inverse fast Fourier transform and [[I/Q]] image/quadrature modulation to the digital lowpass-shaping filter system.

--- Other aspects are set forth in the accompanying detailed description and claims.

Page 9, the third paragraph (extends to page 10), replace with the following new paragraph:

--- FIG. 1 illustrates the dual-mode UWB and WLAN 802.11a communication transceiver 100 in accordance with one embodiment of the present invention. This dual-mode UWB and WLAN 802.11a communication transceiver 100 includes a dual-mode UWB and WLAN multi-carrier RF section 114 that receives and/or transmits multichannel UWB and WLAN 802.11a signals from an antenna [[112]] 110 or to an antenna [[110]] 112. The dual-mode UWB and WLAN multi-carrier RF section 114 is connected with an analog and digital interface section 116 that contains analog-to-digital (A/D) and digital-to-analog (D/A) converters. The analog and digital interface section 116 is coupled to an UWB and WLAN 802.11a digital processing section 118, which performs dual-mode multichannel digital transmission and receiver filtering, rake processing, OFDM, channel estimator, spread/de-spread processing, interleave/de-interleave, and ~~code/de-code~~ encoder/decoder processing. The UWB and WLAN 802.11a digital processing section 118 has an interface with a UWB or WLAN 802.11a network interface section 120 in which is coupled to a UWB or WLAN 802.11a network 122. In accordance with one embodiment of the present invention, the transceiver 100 is the so-called dual-mode UWB and WLAN 802.11a communication transceiver that can both transmit and receive speech, audio, images and video and data information for the indoor and/or outdoor wireless broadband communications.

Page 10, the third paragraph (extends to page 11), replace with the following new paragraph:

--- During the UWB mode, the UWB transmitter 200 receives user data bits 210 with information data rate at 223.4375 Mbps. The information data bits 210 are passed through a 1/2-rate convolution encoder 212 that may produce the double data rate of 446.875 [[Msps]] Mbps by adding redundancy bits. The ~~symbol~~ bit data is then interleaved by using a block interleaver 214. A switch 234 is connected to a position of 236A under a software control unit 228. Then, the output ~~symbols~~ bits of the block interleaver 214 are formed 11 multichannels by using a multichannel PN sequence mapping 218. The ~~symbol~~ bit data rate of each channel is about 40.625 [[Msps]] Mbps. The multichannel PN sequence mapping 218 is used to perform spreading for one ~~symbol~~ bit data with 16 orthogonal spread sequence chips and to produce 650 Mcps for each channel under the software control unit 228. A PN sequence look-up table 216 provides the unique orthogonal sequences for each channel spreading. A switch 240 that is controlled by using the software control unit 228 is connected with a position 238A. Then chip data of each channel is sequentially passed through an outdoor digital lowpass shaping ~~FIR~~ finite impulse response (FIR) filter system 220 to limit the frequency bandwidth with 650 MHz for each channel signal. Each channel signal is passed through a D/A converter 222, which has the 6-bit resolution and sampling frequency rate of 1 GHz provided by a dual-mode sampling rate 240. The software control unit 228 controls the dual-mode sampling rate 240. The output chip data of each channel from the D/A converter 222 is then modulated with a multi-carrier by using a multichannel-based multi-carrier 224 with controlling from the software control unit 228. Thus, the output analog signals of the multichannel-based multi-carrier 224 are passed a power amplifier (PA) 226 through an antenna into air.

Page 12, the first paragraph, replace with the following new paragraph:

--- During the WLAN 802.11a mode, the WLAN 802.11a transmitter 200 receives user data bits 210, which are passed through a 1/2-rate, 2/3-rate or 3/4-rate convolution encoder 212 that may produce 2-times or 3/2-times or 4/3-times data rate by adding redundancy bits. The ~~symbol~~ <u>bit</u> data is then interleaved by using the interleaver unit 214. The switch 234, which is controlled by using the software control unit 228, is connected to a position 236B. Then, the output ~~symbol~~ <u>bits</u> of the interleaver unit 214 are formed the data in parallel to be used for a 64-point IFFT unit 230. The output of the 64-point IFFT unit 230 is performed for an <u>image/quadrature (I/Q)</u> ~~I/Q~~ modulation 232. The switch 240 that is controlled by using the software control unit 228 is connected with a position 238B. Then output data of the I/Q modulation 232 is passed through the digital lowpass shaping FIR filter system 220 to limit the frequency bandwidth with [[60]] <u>20</u> MHz for the channel signal. The channel signal is passed through the D/A converter 222, which has the 6-bit resolution and the oversampling frequency rate of [[720]] <u>480</u> MHz provided by the dual-mode sampling rate 240. The software control unit 228 controls the dual-mode sampling rate 240. The output from the D/A converter 222 is then modulated with a multi-carrier by using the multichannel-based multi-carrier 224 with controlling from the software control unit 228. Thus, the output analog signals of the multichannel-based multi-carrier 224 are passed the power amplifier 226 through an antenna into air.

Page 13, the second paragraph, replace with the following new paragraph:

--- Referring to FIG. 3 is a detailed block diagram 300 of showing the dual-mode sampling frequency rate 220 according to some embodiments. A UWB sampling frequency unit 310 supports the sampling rate at 1 GHz while a WLAN sampling frequency unit 320 provides over-sampling rate of [[720]] <u>480</u> MHz for the use in the D/A converter 222 of FIG. 2. During the UWB mode, a MUX unit 330, which is controlled by using a

selectable unit 340, passes through the UWB sampling frequency unit 310 as the output-sampling rate. During the WLAN mode, the MUX unit 330 passes through the WLAN sampling frequency unit 320 as the output-sampling rate. Thus, the D/A converter 222 operates under controlling the sampling frequency rate either with UWB of 1 GHz or with WLAN of [[720]] 480 MHz. The software control unit 228 controls the selectable unit 340.

Page 16, the last paragraph (extends to page 17), replace with the following new paragraph:

--- FIG. 8 is the outdoor UWB output of multi-carrier frequency spectrums (dBm) 800 including 11 transmitter channel spectrums 820A-820K along with the outdoor FCC emission limitation 810 according to some embodiments. Each channel frequency bandwidth is 650 MHz and is fitted under the outdoor FCC emission limitation 810 with different carrier frequencies. The detail positions of each transmitter channel spectrums (dBm) along with the center, lower and upper frequencies (GHz) as well as channel frequency bandwidth (MHz) are also showed in Table 3, where the label of transmitter channel frequency spectrums are from 820A, ..., 820J, and 820K.

Page 17, the second paragraph (extends to page 18), replace with the following new paragraph:

--- FIG. 9 is the WLAN 802.11a output of multi-carrier frequency spectrum (dB) 900 including 8 lower transmitter spectrums 910A-910H and 4 upper transmitter spectrums 920A-920D according to some embodiments. Each channel frequency bandwidth is [[60]] 20 MHz. The detail positions of each transmitter channel spectrums (dB) along with the center, lower and upper frequencies (GHz) as well as channel frequency bandwidth (MHz) are listed in Table 4.

Table 4

Label of transmitter channel frequency spectrums	Center Frequency (MHz)	Lower Frequency (MHz)	Upper Frequency (MHz)	Frequency Bandwidth (MHz)
910A	5180	~~5150~~ 5170	~~5210~~ 5190	[[60]] 20
910B	5200	~~5170~~ 5190	~~5230~~ 5210	[[60]] 20
910C	5220	~~5190~~ 5210	~~5250~~ 5230	[[60]] 20
910D	5240	~~5210~~ 5230	~~5270~~ 5250	[[60]] 20
910E	5260	~~5230~~ 5250	~~5290~~ 5270	[[60]] 20
910F	5280	~~5250~~ 5270	~~5310~~ 5290	[[60]] 20
910G	5300	~~5270~~ 5290	~~5330~~ 5310	[[60]] 20
910H	5320	~~5290~~ 5310	~~5350~~ 5330	[[60]] 20
920A	5745	~~5715~~ 5735	~~5775~~ 5755	[[60]] 20
920B	5765	~~5735~~ 5755	~~5795~~ 5775	[[60]] 20
920C	5785	~~5755~~ 5775	~~5815~~ 5795	[[60]] 20
920D	5805	~~5775~~ 5795	~~5835~~ 5815	[[60]] 20

Page 18, the last paragraph (extends to page 19), replace with the following new paragraph:

--- During the UWB mode, a low noise amplifier (LNA) 1010, which is coupled to a multichannel-based multi-carrier down converter 1012, receives the UWB signals from an antenna. The output of LNA 1010 is passed through the multichannel-based multi-carrier down converter 1012 to produce the baseband signal for an A/D converter 1014, with 6-bit resolution and sampling frequency rate at ~~720 MHz~~ 1 GHz. The software control unit 228 controls the multichannel-based multi-carrier down converter 1012, the A/D converter 1014 and a dual-mode digital receiver filter system 1016. The bandlimited UWB analog signals are then sampled and quantized by using the A/D converter 1014. The digital signals of the output of the A/D converter 1014 are filtered by using an digital receiver lowpass filter 1016 to remove the out of band signals. A switch 1042, which is also controlled by using the software control unit 228, is

connected to a position 1040A. Thus, the output data of the digital receiver lowpass filter 1016 is used for a rake receiver 1020. The rake receiver 1020 calculates correlation between the received UWB signals and the channel spread sequences and performs coherent combination. The output of the rake receiver 1020 is passed to an equalizer 1022 to eliminate inter-symbol interference (ISI) and inter-channel interference (ICI). A channel estimator 1024 is used to estimate the channel phase and frequency that are passed into the rake receiver 1020 and the equalizer 1022. Then, the output of the equalizer 1022 produces the signals for a de-spreading of PN sequence and de-mapping 1026 to form the UWB signals of ~~symbol~~ bit rate at 446.875 [[Msps]] Mbps. A switch 1046 is connected to a position 1044A. Thus, the ~~symbol~~ bit data is de-interleaved by using a block de-interleaver 1036. The output data of the block de-interleaver 1036 is used for the Viterbi decoder 1038 to decode the encoded data and to produce the information data bits at 223.4375 Mbps.

Page 19, the last paragraph (extends to page 20), replace with the following new paragraph:

--- During the WLAN 802.11a mode, the low noise amplifier (LNA) 1010, which is coupled to the multichannel-based multi-carrier down converter 1012, receives the WLAN 802.11a signals from an antenna. The output of LNA 1010 is passed through the multichannel-based multi-carrier down converter 1012 to produce the baseband signal for the A/D converter 1014, with 6-bit resolution and sampling frequency rate at [[720]] 480 MHz. The software control unit 228 controls the multichannel-based multi-carrier down converter 1012, the A/D converter 1014 and the dual-mode digital receiver filter system 1016. The bandlimited WLAN 802.11a analog signals are then sampled and quantized by using the A/D converter 1014. The digital signals of the output of the A/D converter 1014 are filtered by using the digital receiver lowpass filter 1016 to remove the out of band signals. The switch 1042, which is also controlled by using the software

control unit 228, is connected to a position 1040B. Thus, the output data of the digital receiver lowpass filter 1016 is used for an I/Q demodulation 1030. A FFT unit 1032 is used to the output signal of the I/Q demodulation 1030. The output signal of the FFT unit 1032 is converted from parallel signal into serial signal by using a mapping unit 1034. The switch 1046 is connected to a position 1044B. The channel estimator 1024 is used to estimate the channel phase and frequency that are passed for the FFT unit 1032. Then, the ~~symbol~~ bit data is de-interleaved by using the block de-interleaver 1036. The output data of the block de-interleaver 1036 is used for the Viterbi decoder 1038 to decode the user-encoded data.

Abstract:

Page 29, the abstract, replace with the following new abstract paragraph:

--- DUAL-MODE ~~UWB~~ ULTRA WIDEBAND AND ~~WLAN TRANSCEIVER~~ WIRELESS LOCAL AREA NETWORK COMMUNICATIONS

Abstract of the Disclosure

A dual-mode ultra wideband (UWB) and wireless local area network (WLAN) communication transceiver is used to implement two disparate systems of UWB and WLAN ~~operation~~ communications within a single device ~~according to present invention~~. During the UWB mode, the ~~dual-mode~~ communication transceiver sends and receives the UWB signal ~~using transmitter and receiver filters as well as deals with baseband functions of multichannel PN sequence mapping and demapping, rake receiver, equalizer and channel estimation with programmability~~ at very-high data rate with a relative short transmission range. During the WLAN mode, the ~~dual-mode~~ communication transceiver sends and receives the WLAN signal ~~using transmitter and receiver filters as well as processes baseband functions of IFFT and FFT, I/Q modulation and demodulation, and channel estimation with programmability. In addition, the multichannel-based multicarrier for the UWB and WLAN transceiver can be controlled to provide information for transmitting or no-transmitting certain UWB channel signals to avoid the interference between UWB and WLAN device.~~ at a relative low data rate, but with a longer transmission range. Thereby, trade-off benefits of the dual-mode UWB and WLAN communication transceiver can be mutually utilized to achieve seamless wireless broadband communications between two different standards.

Claims:

Amend claims from 1 – 9.

Claim 1 (amended): A dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver comprising:

a digital lowpass-shaping filter system coupled to a [[UWB]] ultra wideband multichannel [[PN]] pseudorandom noise sequence mapping or a ~~WLAN IFFT~~ wireless local area network inverse fast Fourier transform and [[I/Q]] image/quadrature modulation;

a dual-mode sampling frequency rate coupled to a digital-to-analog converter; and

a switch to connect from the [[UWB]] ultra wideband multichannel [[PN]] pseudorandom noise sequence mapping or the ~~WLAN IFFT~~ wireless local area network inverse fast Fourier transform and [[I/Q]] image/quadrature modulation to the digital lowpass-shaping filter system.

Claim 2 (amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 1 wherein said digital lowpass-shaping filter system can be controlled by using said switch to connect said [[UWB]] ultra wideband multichannel [[PN]] pseudorandom noise sequence mapping or said ~~WLAN IFFT~~ wireless local area network inverse fast Fourier transform and [[I/Q]] image/quadrature modulation.

Claim 3 (amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 1 wherein said digital lowpass-shaping [[FIR]] finite impulse response filter system includes:

an indoor [[UWB]] ultra wideband digital [[FIR]] finite impulse response lowpass shaping filter;

an outdoor [[UWB]] ultra wideband digital [[FIR]] finite impulse response lowpass shaping filter;

an [[WLAN]] wireless local area network digital multistage [[FIR]] finite impulse response lowpass shaping filter; and

[[two]] controllable switches.

Claim 4 (amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 3 wherein said digital lowpass-shaping [[FIR]] finite impulse response filter system can select to use said indoor [[UWB]] ultra wideband digital [[FIR]] finite impulse response lowpass shaping filter or said outdoor ~~UWB FIR~~ ultra wideband finite impulse response lowpass shaping filter or said [[WLAN]] wireless local area network digital multistage [[FIR]] finite impulse response lowpass shaping filter by using said [[two]] controllable switches.

Claim 5 (amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 3 wherein said [[WLAN]] wireless local area network digital multistage [[FIR]] finite impulse response lowpass shaping filter comprises:

a first stage of upsampling by [[2]] M, where M is an integer, and a [[WLAN]] wireless local area network digital [[12^{th}]] Nth enlarged band lowpass shaping [[FIR]] finite impulse response filter; and

a second stage of upsampling by [[12]] N, where N is an integer, and a [[WLAN]] wireless local area network

digital rejected lowpass [[FIR]] finite impulse response filter[[.]], where N is greater than M.

Claim 6 (amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 5 wherein said [[WLAN]] wireless local area network digital multistage [[FIR]] finite impulse response lowpass shaping filter is a two stage interpolation lowpass shaping [[FIR]] finite impulse response filter with upsampling of [[24]] MN, where M and N are integers.

Claim 7 (amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 1 wherein the dual-mode sampling frequency rate includes:

a [[UWB]] ultra wideband sampling frequency unit;

a [[WLAN]] wireless local area network sampling frequency unit;

a MUX unit; and

a selectable unit.

Claim 8 (amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 7 wherein said dual-mode sampling frequency rate can be controlled to select either one sampling rate for the [[UWB]] ultra wideband mode or other sampling rate for the [[WLAN]] wireless local area network mode by using said MUX unit with said selectable unit.

Claim 9 (amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network

transceiver of claim 1 wherein said only one digital-to-analog converter is needed for the dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transmitter.